

CLAIMS

What is claimed is:

1. A method for preserving frame order of a plurality of frames transmitted over a plurality of communication links, the method comprising:

(a) receiving up to a plurality of indications denoting the start of frame transmission on a corresponding plurality of communication links; and
(b) assigning a pointer value to each of a plurality of records in a buffer receiving the corresponding plurality of frames based, at least in part, on a relative order in which the indications are received.

2. The method of claim 1, further comprising:
reading the received frames out of the buffer based, at least in part, on the pointer value.

3. The method of claim 2, wherein the frames are read out of the buffer in an increasing pointer value order.

4. The method of claim 1, wherein the indication is an analog indication.

5. The method of claim 4, wherein the data network is an Ethernet network and the indication is a receive data valid (RX_DV) signal.

6. The method of claim 1, wherein the plurality of frames are a plurality of frame sizes.

1 ~~7. The method of claim 1, wherein the buffer order does not correspond to the order of~~
2 ~~frame transmission.~~

1 8. The method of claim 1, wherein the plurality of frames are read out of the buffer in
2 accordance with their pointer value, which is different than the order in which the frames are
3 ~~stored in the buffer.~~

1 9. An apparatus comprising:
2 a buffer having a plurality of records; and
3 a network interface, coupled to the buffer, to receive a plurality of frames from a plurality
4 of communication links, to store the frames in a corresponding plurality of records within the
5 buffer in order of receipt, and to assign a pointer value to each of the plurality of records denoting
6 a relative order of frame transmission of each of the plurality of frames.

10. The apparatus of claim 9, wherein the network interface receives, for each of the plurality
of communication links, an indication denoting the commencement of frame transmission to
assign the pointer value.

1 11. The apparatus of claim 9, wherein the plurality of communication links are part of an
2 Ethernet network.

1 ~~12. The apparatus of claim 9, wherein the indication is an analog indication.~~

1 13. The apparatus of claim 12, wherein the indication is an asserted receive data valid signal.

1 14. The apparatus of claim 9, wherein the network interface promotes frames stored in the
2 plurality of records of the buffer to a system state in order of pointer value.

1 ~~15.~~ In a data network, a method for preserving frame order of a plurality of frames
2 transmitted across a multi-link trunk, the method comprising:

3 (a) receiving up to a plurality of indications denoting commencement of frame
4 transmission on the multi-link trunk; and

5 (b) assigning a plurality of pointer values to a corresponding plurality of records in a
6 buffer receiving the corresponding plurality of transmitted frames based, at least in part, on a
7 relative order in which the indications are received.

8 16. The method of claim 15, wherein the multi-link trunk is comprised of a plurality of
9 physical links aggregated as a single logical link.

10 17. The method of claim 15, wherein the indications are an analog signal denoting receive
11 data valid.

12 18. The method of claim 15, further comprising promoting the received frames from the
13 buffer based on pointer value order.

14 19. A network device to communicate with other network devices through a multi-link trunk,
15 the network device comprising:

16 a buffer having a plurality of records; and

17 a network interface, coupled to the buffer and the multi-link trunk, to receive a plurality
18 of data frames from the multi-link trunk, store the frames in a corresponding plurality of records

6 in the buffer, and to assign a pointer value to each of the plurality of records denoting the relative
7 order of frame transmission commencement of each of the plurality of frames.

1 20. The network device of claim 19, wherein the multi-link trunk is comprised of a plurality
2 of physical links.

1 21. The network device of claim 20, wherein the network interface receives, for each of the
2 plurality of physical links comprising the multi-link trunk, an indication denoting the
3 commencement of frame transmission on each physical link, and uses the indication to assign
4 pointer values.

Sub A
13 22. ~~The network device of claim 19, wherein the network interface promotes each of the~~
14 ~~plurality of frames stored in the buffer to a system state in order of pointer value, irregardless of~~
15 ~~an order in which they are stored in the buffer.~~